

PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Arata TOMITA

Application No.: To be assigned
Divisional of 09/042,642

Group Art Unit: To be assigned

Confirmation No.: To be assigned

Examiner: To be assigned

Filed: May 10, 2001

For: PNEUMATIC TIRE

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

The specification is changed as follows:

Page 1, before the first paragraph, please add the following:

This is a Divisional of Application No. 09/042,642 filed March 17, 1998, the disclosure of which is incorporated herein by reference.

Page 1, please delete the second paragraph and replace it as follows:

Generally, in pneumatic tires provided with block patterns, irregular wear known as heel-and-toe wear, results in steps due to wear at the leading (step-in) edges and the trailing (kick-out) edges of blocks, and tends to occur. Such wear is accompanied by a deterioration in external appearance and noise, and there is a definite need to solve this drawback.

Pages 2 and 3, please delete the paragraph that bridges these two pages and replace it with the following:

However, it is difficult to greatly change the angle of the groove wall surfaces due to problems such as removing the tire from a mold at the time of vulcanization or the like. Further, as wear progresses, the width of the groove has a distribution which differs greatly than that at the time the tire was new, which is not preferable from the standpoint of performance nor from the standpoint of external appearance.

Page 5, please delete the first full paragraph and replace it as follows:

The term "ground-contact configuration" as used herein is defined as follows. In accordance with the 1996 JATMA Year Book ("JATMA" stands for the "Japan Automobile Tire Manufacturers' Association, Inc."), a tire is rim-assembled to a standard rim at an applied size, and the tire is filled with air pressure corresponding to the maximum load capacity at the applied size/ply rating in accordance with the 1996 JATMA Year Book. The ground-contact configuration is measured when there is a load of 80% of the maximum load capacity at the applied size/ply rating in accordance with the 1996 JATMA Year Book (where there is both description of a single tire and plural tires, the description of the single tire is applicable).

Pages 5 and 6, please delete the paragraph that bridges these two pages and replace it as follows:

In the pneumatic tire of the first aspect of the present invention, a sipe which is substantially parallel to the contour line at the trailing edge of the ground-contact configuration is provided in a region at the trailing edge of each block at the shoulder side. Therefore, from the time of step-in to the time of kick-out of a block, the effect of the shearing strain transmitted to the trailing edge from the preceding trailing edge region is mitigated, the movement of the trailing edge with respect to the road surface is suppressed, and wear at the trailing edge (the toe side), i.e., heel-and-toe wear, is suppressed.

Page 8, please delete the third full paragraph and replace it as follows:

As illustrated in Fig. 1, four circumferential direction main grooves 14, which extend along the circumferential direction of the tire (the direction of arrow R and the direction opposite to the direction of arrow R, the direction of arrow R representing the primary direction of rotation of the tire), are formed in a tread 12 of a pneumatic tire 10 of the present first embodiment. At the tire transverse direction (the direction of arrow W) outer sides of the circumferential direction main grooves 14 which are formed at the tire transverse direction sides, a plurality of blocks 18, which are defined by these circumferential direction main grooves 14 and a plurality of transverse direction grooves 16 extending along the tire transverse direction, are disposed along the circumferential direction of the tire.

Pages 9 and 10, , please delete the paragraph that bridges these two pages and replace it as follows:

As illustrated in Fig. 2, envisaging the time when the pneumatic tire 10 rotates in the direction of the arrow R on a road surface 34, for example, there is a block 18A at which only the leading edge end portion thereof contacts the road surface 34, blocks 18B-18E which entirely contact the road surface 34, and a block 18F which begins to move apart from the road surface 34 (i.e., only the trailing edge side end portion thereof contacts the road surface 34).

Pages 10 and 11, please delete the paragraph that bridges these two pages and replace it as follows:

The sipes 32, 36 of the present first embodiment are linear, and the end portions thereof are not connected to the circumferential direction main grooves 14. However, the present invention is not limited to the same configuration. As illustrated in Fig. 3, end portions of the sipes 32, 26 may be connected to the circumferential direction main grooves 14. As illustrated in Fig. 4, portions of the sipes 32, 36 may be curved. Further, the entire sipes 32, 26 may be curved provided that they are substantially parallel to the contour line of the ground-contact configuration 30.

Page 12, please delete the first full paragraph and replace it with the following:

Shoulder blocks 42, defined by the inclined grooves 38 and the circumferential direction main grooves 14, are disposed along the tire circumferential direction at both shoulder portion sides (both tire transverse direction sides) of the tread 12. Second blocks 44, which are similarly defined by the circumferential direction main grooves 14 and the inclined grooves 38, are disposed between the shoulder blocks 42 and the rib 40 along the circumferential direction of the tire.

Page 15, please delete the first full paragraph and replace it as follows:

In the evaluation of the comparison of the tires, the difference in the amount of wear between the trailing edge and the leading edge of the block at the shoulder side was expressed as an index with the Conventional Example Tire being 100. Higher values indicate smaller wear differences which is better. The results are shown in following Tables 1 and 2.

Page 16, please delete the first full paragraph and replace it as follows:

It will be understood from the experimental results listed in Table 1, the Example Tire 1 to which the present invention is applied exhibits a great reduction in the amount of the step due to wear and the noise level as compared with Conventional Example Tire 1 and the Comparative Example Tire.

Pages 16 and 17, please delete the paragraph that bridges these two pages and replace it as follows:

It will be understood from Table 2, the Example Tires 2 and 3 to which the present invention is applied exhibit greatly reduced amounts of steps due to wear and noise levels as compared to Conventional Example Tire 2. Further, Example Tire 3, which was provided with sipes at the leading edge regions of the blocks as well, results in an even greater decrease in the noise level than Example Tire 2.

IN THE CLAIMS:

Claims 1-6, 8, 12-14, and 16-17 are canceled.

The claims are amended as follows:

7. (Amended) A pneumatic tire according to claim 19, further comprising another sipe substantially parallel to the contour line at the trailing edge of the ground-contact configuration and is inclined opposite said tire primary rotational direction as the another sipe extends toward the axial direction outer-side of the tire, said another sipe being formed in a trailing edge region of each of blocks adjacent to and at tire transverse direction inner sides of the blocks at the shoulder sides of said pneumatic tire.

9. (Amended) A pneumatic tire according to claim 18, wherein said sipe is formed in a tire transverse direction inner side of each of the blocks at the shoulder sides.

10. (Amended) A pneumatic tire according to claim 19, wherein said sipe and said second sipe are formed in a tire transverse direction inner side of each of the blocks at the shoulder sides.

11. (Amended) A pneumatic tire having a tread pattern including a plurality of blocks defined by a plurality of circumferential direction grooves extending substantially along a tire circumferential direction and a plurality of transverse direction grooves extending substantially along a tire transverse direction, wherein a sipe, which is inclined opposite a tire primary rotating direction as the sipe extends toward the axial direction outer-side of the tire, is formed in a trailing edge region of selected blocks of the plurality of blocks, and wherein said sipe is substantially parallel to a tangent line that is tangent to a contour line at a trailing edge at a ground-contact configuration.

15. (Amended) A pneumatic tire according to claim 11, further comprising a another sipe, which is inclined opposite the tire primary rotating direction as the another sipe

extends toward the axial direction outer-side of the tire, said another sipe formed in each of blocks which are adjacent to and at tire transverse direction inner sides of the blocks at the shoulder sides of said pneumatic tire.

Please add the following new claims:

18. (New) A pneumatic tire having a tread pattern including a plurality of blocks defined by a plurality of circumferential direction grooves extending substantially along a tire circumferential direction and a plurality of transverse direction grooves extending substantially along a tire transverse direction, wherein a sipe formed in a region at a trailing edge of each of blocks at shoulder sides of said pneumatic tire among the plurality of blocks, wherein both said sipe and a contour line at a trailing edge of a ground-contact configuration are inclined opposite a tire primary rotation direction as the sipe extends toward the axial direction outer-side of the tire, said sipe and said contour line are substantially parallel to each other at a same axial distance from an equatorial plane of the tire.

19. (New) A pneumatic tire having a tread pattern including a plurality of blocks defined by a plurality of circumferential direction grooves extending substantially along a tire circumferential direction and a plurality of transverse direction grooves extending substantially along a tire transverse direction, wherein a sipe is formed in a region at a trailing edge of each of blocks at shoulder sides of said pneumatic tire among the plurality of blocks, the sipe and a line tangent to a contour line at a trailing edge of a ground-contact configuration being inclined opposite a tire primary rotation direction as the sipe extends toward the axial direction outer-side of the tire, and being substantially parallel to each other at a same axial distance from an equatorial plane of the tire.

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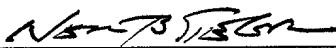
Attorney Docket No. Q64221

REMARKS

Entry and consideration of this Amendment is respectfully requested.

Respectfully submitted,

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Neil B. Siegel
Registration No. 25,200

Date: May 10, 2001

APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

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and the tire is filled with air pressure corresponding to the maximum load capacity at the applied size/ply rating in accordance with the 1996 JATMA Year Book. The ground-contact configuration is measured when there is a load of 80% of the maximum load capacity at the applied size/ply rating in accordance with the 1996 JATMA Year Book (where there is both description of a single tire and plural tires, the description of the single tire is applicable).

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IN THE CLAIMS:

Claims 1-6, 8, 12-14, and 16-17 are canceled.

The claims are amended as follows:

7. (Amended) A pneumatic tire according to claim ~~1~~ 19, ~~wherein further~~ comprising a another sipe substantially parallel to the contour line at the trailing edge of the ground-contact configuration and is inclined opposite said tire primary rotational direction as the another sipe extends toward the axial direction outer-side of the tire, said another sipe being is

formed in a trailing edge region of each of blocks adjacent to and at tire transverse direction inner sides of the blocks at the shoulder sides of said pneumatic tire.

9. (Amended) A pneumatic tire according to claim ~~1~~ 18, wherein said sipe is formed in a tire transverse direction inner side of each of the blocks at the shoulder sides.

10. (Amended) A pneumatic tire according to claim ~~2~~ 19, wherein said sipe and said second sipe are ~~is~~ formed in a tire transverse direction inner side of each of the blocks at the shoulder sides.

11. (Amended) A pneumatic tire having a tread ~~patter~~ pattern including a plurality of blocks defined by a plurality of circumferential direction grooves extending substantially along a tire circumferential direction and a plurality of transverse direction grooves extending substantially along a tire transverse direction, wherein a sipe, which is inclined ~~with respect to a tire rotational axis such that a tire transverse direction inner side of said sipe is disposed further toward a tire rotating direction side than a tire transverse direction outer side of said sipe~~ opposite a tire primary rotating direction as the sipe extends toward the axial direction outer-side of the tire, is formed in a trailing edge region of selected blocks of the plurality of blocks, and wherein said sipe is substantially parallel to a tangent line that is tangent to a contour line at a trailing edge at a ground-contact configuration.

15. (Amended) A pneumatic tire according to claim 11, ~~wherein further comprising a~~ another sipe, which is inclined ~~with respect to a tire rotational axis such that a tire transverse direction inner side of said sipe is disposed further toward a tire rotating direction side than a tire transverse direction outer side of said sipe~~ opposite the tire primary rotating direction as the another sipe extends toward the axial direction outer-side of the tire, ~~is formed in each of blocks at shoulder sides of said pneumatic tire and in each of second~~ said another sipe formed in

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each of blocks which are adjacent to and at tire transverse direction inner sides of the blocks at the shoulder sides of said pneumatic tire.

Claims 18 and 19 are added as new claims.